Spin glass state in Kagomé antiferromagnet $Co(NO_3)_2 \cdot (bpg)DMF_{4/3}$

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The results of static, alternating susceptibility and specific heat of $Co(NO_3)_2 \cdot (bpg)DMF_{4/3}$ are reported. The studied material consists of Kagomé layers created by Co(II) ions linked by azido ligands. The layers are connected by bridging *meso*-α, β-bi(4-pyridyl)glykol(bpg) ligands creating a 3D network of exchange paths. The analysis of static susceptibility using Curie-Weiss law yielded θ = - 165.8 K revealing strong antiferromagnetic coupling. Sharp increase of effective magnetic moment below 16 K suggests a weak-ferromagnet state [1]. The transition to magnetically ordered state was confirmed by a small spike in specific heat observed at 16.5 K, which is supressed by magnetic field. The behavior supports ferro-magnetic nature of the ordered state. Systematic study of alternating susceptibility revealed frequency - dependent hump located at nominally 8 K. Its presence suggests that spins continue to fluctuate even below ordering temperature until spin - glass state is established. The analysis in terms of Cole-Cole formalism yielding $\alpha \approx 0.9$ confirms a wide distribution of relaxation times. The temperature dependence of the median relaxation time analyzed using dynamic scaling approach and modified Arrhenius formula yielded for both approaches the value of the dynamical exponent $z\nu \approx 4$ found in spin - glass systems.
[1] X. Y. Wang, L. Wang, Z. M. Wang, and S. Gao, J. Am. Chem. Soc. **128**, 674 (2006).